UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
UNITED NATIONS CENTRE FOR HUMAN SETTLEMENTS (HABITAT)

SECOND CONSULTATION ON THE BUILDING MATERIALS INDUSTRY

Athens, Greece, 4–8 November 1991

REPORT

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PREFACE

The System of Consultations is an instrument through which the United Nations Industrial Development Organization (UNIDO) serves as a forum for developed and developing countries in their contacts and discussions directed towards the industrialization of the latter countries. Participants in the Consultations include government officials, as well as representatives of industry, labour, consumer groups and others, as deemed appropriate by the Governments concerned. The System facilitates negotiations among interested parties, at their request, either during or after the Consultation meetings.

Benefits deriving from this activity include the identification of obstacles to industrial development in developing countries; the monitoring of trends in world industry with a view to identifying action-oriented measures for increasing the industrial output of developing countries; and the search for new forms of international industrial cooperation in North-South and South-South relations.

Since the inception of the System 1/ in 1975, Consultations have been held on the following industries and topics: agricultural machinery, building materials, capital goods, electronics, fertilizers, fisheries, food processing, industrial financing, iron and steel, leather and leather products, non-ferrous metals, petrochemicals, pharmaceuticals, small- and medium-scale enterprises, the training of industrial manpower, vegetable oils and fats, and wood and wood products. The System brings together sectoral decision makers to deliberate on and propose concrete measures to accelerate the process of industrialization in developing countries. It has generated many innovations, particularly with respect to technological alternatives, integrated development and contractual arrangements. The many opportunities thus provided have led to the implementation of projects in technical assistance, investment promotion and technology transfer.

The Consultation process, by virtue of its consensual and normative character, has revealed itself to be an efficient vehicle for fostering cooperation. It is eminently suited to assist member States in the formulation of strategies and policies for industrial development.

The System of Consultations operates under the continuous and close guidance of the Industrial Development Board of UNIDO. In addition to undergoing annual reviews and occasional progress appraisals, the System was subjected to an in-depth evaluation in 1989, which concluded that it was making a major contribution to the development and formulation of UNIDO policies and programmes in specific sectors through integration and interaction with the other main activities of UNIDO.

1/ See Report of the Second General Conference of the United Nations Industrial Development Organization (ID/CONF.3/31), chap. IV, "The Lima Declaration and Plan of Action on Industrial Development and Co-operation", para. 66.

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Explanatory note

In the present document, the designations are those that were in use when the data were being compiled.

INTRODUCTION

1. The Second Consultation on the Building Materials Industry was held at Athens from 4 to 8 November 1991. The Consultation was attended by 137 participants from 45 countries and two non-governmmental organizations (see annex I).

2. The Consultation was organized by UNIDO jointly with the United Nations Centre for Human Settlements (Habitat) and hosted by the Government of Greece.

Background to the Second Consultation

3. In preparation for the Second Consultation on the Building Materials Industry, and on the basis of the conclusions and recommendations of the First Consultation on the Building Materials Industry, held at Athens in March 1985, 1/ the UNIDO Secretariat convened a regional expert group meeting in October 1988, in Guatemala City, in cooperation with the Permanent Secretariat of the General Treaty on Central American Economic Integration (SIECA). 2/ A regional study was undertaken by UNIDO for discussion with a view to identifying the main issues affecting the production of building materials and the opportunities for cooperation between the Central American countries in the development of the industry.

4. Pursuant to this preliminary work, the UNIDO Secretariat, in cooperation with Habitat, organized an Interregional Expert Group Meeting on the Building Materials Industry for Africa and Asia, which was held at Nairobi in November 1989. 3/ Studies were carried out by each organization in addition to country case-studies prepared by the participants.

5. The objectives of these meetings were: (a) to analyse the trends in the building materials industry, including low-cost building materials, and to identify the main obstacles faced by the developing countries in the regions concerned; (b) to analyse the implications arising from the transfer of technology and standards for indigenous building materials; and (c) to propose measures to overcome the main constraints on the industry in order to assist the developing countries in their efforts to promote a more dynamic system of production. The importance of objectives (a) and (b) was particularly emphasized at the interregional meeting.

1/ "First Consultation on the Building Materials Industry, Athens, Greece, 26-30 March 1985: report" (ID/335).

2/ "Report: Regional Expert Group Meeting on Co-operation and Development in the Field of Building Materials Production, Guatemala City, Guatemala, 24-27 October 1988" (ID/WG.479/4(SPEC.)).

3/ "Report: Interregional Expert Group Meeting on the Building Materials Industry for Africa and Asia, Nairobi, Kenya, 20-23 November 1989" (ID/WG.496/4(SPEC.)).

Objectives of the Consultation

6. The objectives of the Consultation were primarily:

(a) To discuss the current situation of the building materials industry in the developing countries and to review the various constraints affecting its productivity and development;

(b) To assess the opportunities and prerequisites for increasing local production by making greater use of locally available resources;

(c) To examine the mechanisms for strengthening regional and inter-regional cooperation between entrepreneurs from developed and developing countries and between those of the developing countries;

(d) To identify technical assistance projects that could assist the developing countries in their efforts to promote their national building materials industries;

(e) To formulate policy- and action-oriented recommendations addressed to Governments, regional and interregional institutions, the private sector and the international community.

7. Based on the preparatory work and the conclusions and recommendations of the regional and interregional expert group meetings, the following issues, developed by UNIDO and Habitat, were proposed for discussion at the Consultation:

(a) Strategies and policies for the development of the building materials industry in developing countries;

(b) Measures to strengthen the low-cost building materials sector in developing countries.

8. The Second Consultation on the Building Materials Industry was part of the work programme of the System of Consultations for the biennium 1990-1991, which was approved by the Industrial Development Board at its fourth session. 4/

4/ Report of the Industrial Development Board on the work of its fourth session (GC.3/2), annex I, IDB.4/Dec.8.

AGREED CONCLUSIONS AND RECOMMENDATIONS

9. The Consultation agreed on the conclusions and recommendations set out below.

10. Existing government policies, in most cases, fall short of addressing the problem of meeting the demand in the housing sector in a timely and cost-effective manner. The situation calls for new policy initiatives at the national level. Those required to contribute to the development of such policies, apart from the end-user, include planners, decision makers, research and development institutions, training organizations, financing institutions and the building materials and construction industry. Furthermore, those policies should be conceived as an integral part of national socio-economic development policy. In conceiving national policies in the building materials sector, adequate consideration should be paid to specific country conditions, such as geo-climatic conditions and material endowments, socio-economic conditions, employment policies and traditional capabilities. Likewise, the need for consultation with the local population and professional structures should be taken into account.

11. The implementation and realization of national housing policies and programmes, and meeting the growing needs of the developing countries in various fields of building activity, is adversely affected owing to constraints such as:

(a) Insufficient financial resources;

(b) Inadequate infrastructure and institutional mechanisms;

(c) Inadequate technical capabilities limiting the selection and assimilation of appropriate and viable technologies and the desirable choice of scale of operations, which may also lead to production losses, environmental degradation, and waste of energy and raw materials during production;

(d) Lack of innovative approaches and strategies.

12. A correct assessment and analysis of needs and effective demand focusing on different income groups, particularly the low-income brackets, is necessary to identify the type of building materials required to support a viable scale of operations for the construction and upgrading of existing buildings.

13. Recognizing its potential contribution to the gross domestic product, the building materials sector should receive due prominence within the overall manufacturing sector, which has not always been the case in most developing countries.

14. In meeting the targets of national housing policies and programmes, innovative approaches should be explored and traditional ones re-examined, in order to improve the production of cost-effective building materials and components. In this context, optimal use should be made of local raw materials, and artisanal and industrial processes with a view to meeting the demand for building materials. Pilot and demonstration projects should be initiated by national Governments and international organizations should support these wherever required. This approach will, in addition, encourage the acceptance of new

products and technologies by all the actors, including professionals and end-user communities.

15. In developing countries, most Governments accord a relatively low priority to the allocation of financial resources to the building materials and housing sector. This problem is further complicated by the general lack of financial resources in these countries. In allocating resources, Governments should take into account the long-term benefits to be derived from investments in this sector.

16. The international financing institutions are urged to review their lending policies for this sector in view of its crucial role in the national economy. The structural adjustment policies currently under way in some countries should take into account the need for the sustained development of the sector.

17. There is an urgent need to undertake research and development on the potential and limitations of locally available resources, such as natural raw materials, industrial wastes and agricultural residues. Research and development capabilities need to be strengthened at training and technical centres, universities and laboratories. Research and development infrastructures should be further utilized to render services at the national, subregional and regional levels. These research and development institutions and specialized centres, in their role of disseminating information and exchanging knowledge and experience, should forge links with the United Nations and other relevant international organizations so as to enhance South-South as well as North-South cooperation.

18. National agencies, in cooperation with international agencies if needed, should prepare detailed inventories and set up databases on natural resources. Apart from other uses, this information is needed to carry out qualitative and quantitative analyses on these resources in order to ensure their economic viability and technical feasibility. Existing regional and interregional institutions should utilize such databases for the purpose of monitoring and disseminating information and exchanging experience.

19. The creation of a conducive investment climate can provide a needed boost to the development of the sector. This can be achieved inter alia through:

(a) Fiscal and other incentives;

(b) Tariff reforms;

(c) Foreign trade liberalization;

(d) Adoption of appropriate standards and building codes.

The creation of such an environment is expected to encourage joint ventures and equity participation etc.

20. The rehabilitation of existing production facilities for building materials in developing countries provides scope for a desired increase in supplies; however, any envisaged rehabilitation project should be preceded by an in-depth assessment of its economic viability.

21. An environmental impact assessment should be an integral part of building materials manufacture and housing projects in order to provide and conserve satisfactory living conditions.

22. The local assimilation of imported technology poses the most crucial challenge in the acquisition and transfer of technology. Attempts should therefore be made to ensure that complete technological packages are negotiated encompassing adequate provisions for training, engineering know-how, maintenance and subsequent technical back-up support.

23. In adopting national standards and performance norms for low-cost building materials, a pragmatic approach should be taken to encourage the enhanced production and utilization of locally manufactured materials. Appropriate standards and technical specifications for low-cost materials will also facilitate their acceptance in public construction projects. National-level committees comprising all actors in the sector should be responsible for the formulation and adoption of such standards and regulations, as well as for quality assurance measures.

24. International agencies should take the initiative in bringing together countries facing similar problems and possessing comparable geological and socio-economic characteristics and industrial set-ups and capabilities, with a view to sharing information and experience. This will ensure an optimum utilization of technical assistance funds and further promote international industrial cooperation, particularly its South-South component.

25. While improving the performance and quality of traditional low-cost building materials, aspects such as cost, durability, effective demand and the absorptive capacity of the market should be considered. Since the building materials market is demand-driven, special care should be taken to avoid the uncontrolled depletion and degradation of local resources.

26. Energy consumption is a major component in the manufacture of building materials. The rising demand for building materials will lead to higher energy demands, which can be partially offset by the adoption of energy-efficient process technologies, as well as the utilization of non-conventional and renewable energy sources.

27. The in-service training of professionals involved in the production and application of building materials should be encouraged to create confidence in low-cost and innovative materials and components. It is also recommended that pertinent information on these new developments be adequately reflected in the curricula of vocational and academic institutions.

28. Recognizing the need for extending the relevant innovative design and construction techniques at the grass-roots level, appropriate centres should be set up with a view to upgrading skills, and training artisans, entrepreneurs and supervisors etc. These centres should be assisted to build capabilities for demonstrating the viability of new technologies and products. At a subsequent stage, it would be desirable to establish a network of such centres as decentralized points for the wider diffusion of new technologies in the country.

29. In order to encourage the production of new building materials based on innovative processes and technologies, particularly in the small-scale sector, there is a need for extending venture capital support to entrepreneurs to encourage investment in the sector. A prerequisite for the granting of such support may consist, inter alia, in an adequate technical link-up to that support process by an established research and development institution or consultant group.

30. While promoting the building materials industry, due consideration should be given to the nature and extent of demand in order to ensure optimal utilization of the resources invested and affordability of products and components. In respect to housing, demand assessment would be based primarily on purchasing power, socio-economic preferences, climatic conditions and the disaster-proneness of the region. Notwithstanding these considerations, Governments should initiate policies that will facilitate the acquisition of shelter by the disadvantaged segments of the population.

31. Recognizing the integral nature of the design and use of building materials, it is expedient to launch promotional programmes to establish confidence among professionals and end-users (including contractors) in the manufacture and application of traditional materials and components. This will create wider acceptance of local and traditional building materials in public and private construction projects.

32. It is desirable to set up an interdisciplinary mechanism at the national level to coordinate the role of all actors involved in the development, production, distribution and application of building materials. Such a system will bridge the gap between research and development, manufacturing, decision makers, professionals and users, by facilitating continuous interaction between all concerned, with the assistance of international organizations.

33. Recognizing that a number of countries are in the process of transforming their economies from centrally planned to market-oriented systems, international organizations may, upon request, render technical assistance to these countries in their efforts to revitalize and reorganize their building materials and construction industries. The international organizations should disseminate the experience gained in this process to developing countries.

Approval of "Elements of an operational strategy for the development of the low-cost building materials sector"

34. The Consultation also approved by consensus the elements of an operational strategy for the development of the low-cost building materials sector, which had been set out in a paper prepared by Habitat and submitted to the participants for their consideration and approval.

Elements of an operational strategy for the development of the low-cost building materials sector

A. Rationale

(1) Despite efforts by Governments and international organizations, there is considerable scope for the improvement of the performance of the low-cost building materials sector. Coherent and coordinated action will be required by all the parties concerned to exploit the full productive potential of the sector. While a workable strategy must be country-specific so as to maximize national resource endowments, and will necessarily have to be shaped by individual countries, the key elements of a global strategy can be identified that can provide a framework for the formulation of a national strategy.

B. Objective

(2) The central objective of a strategy for the low-cost building materials sector is to improve its overall performance by improving its productivity, energy-efficiency and the quality of its output, and by reducing the costs of production.

C. General considerations

(3) The strategy should be based on an "enabling" approach, stimulating the action of all parties in the low-cost building materials sector.

(4) The promotion of community participation, at the local level, should be a key element of the strategy. Local-level initiatives should be supported in the areas of training, motivation and promotional activities so as to enable local communities to share the responsibilities and benefits associated with the growth of the low-cost building materials sector.

(5) The strategy should address both supply-side and demand-side constraints on the sector in a specific and realistic manner.

(6) The strategy for the low-cost building materials sector should reflect the forward and backward linkages of the sector with other sectors of the economy in general, and with the construction sector in particular.

D. National action

1. Policy environment

(7) Creating a policy environment conducive to the growth of the sector should be given urgent priority at the national level. This should be fostered through national dialogue, with the participation of government representatives, professional bodies, the industry and non-governmental organizations active in the sector. A national-level apex coordination body, with representatives of all the parties concerned, should be set up for this purpose. This body should promote the sector through intersectoral coordination, reviews and, where possible, reforms of sectoral and intersectoral policies, institutional arrangements and the mobilization of resources for the sector.

2. Role of entrepreneurs

(8) Entrepreneurs are the central actors in and the driving force behind the growth of the sector. A national strategy should, therefore, strive to involve the entrepreneurs in all decision-making processes.

3. Development, transfer and diffusion of technology

(9) Traditional technology is the mainstay of the low-cost building materials sector. Efforts aimed at the technological upgrading of the sector should, therefore, be directed towards refining and

improving existing technologies alongside introducing alternative appropriate technologies.

(10) National databases should be established on available technologies appropriate to the sector. Furthermore, guidelines should be established at the national level for the acquisition of technology from foreign sources. Such guidelines, together with listings of sources of technology, should be disseminated through local building centres.

(11) Governments should provide incentives, such as matching grants and providing tax incentives etc., to the low-cost building materials sector for introducing new and innovative technologies.

4. Institutional support

(12) Small industry development organizations should give priority attention to the low-cost building materials sector. They should concentrate their limited resources on selected areas of the sector for sustained support.

(13) The access of small-scale producers to essential input, such as raw materials, should be facilitated through such measures as reserving land for mining, quality testing of raw materials etc.

(14) Banks and development finance institutions should be directed to provide credit to the low-cost building materials sector on flexible terms. Equity participation should be encouraged, wherever possible.

(15) The human resource needs of the sector should be addressed, with special emphasis on entrepreneurship development and the integration of women into industrial development.

(16) National standards organizations should give priority to the formulation of realistic standards and specifications for low-cost building materials.

5. Marketing support

(17) The sustained demand for low-cost building materials should be ensured through their increased use in government-funded construction projects. This will require overcoming the prejudices among professionals against the use of low-cost building materials.

(18) Government agencies should organize demonstration projects to promote the competitiveness of low-cost building materials compared with those produced by large enterprises.

(19) Existing industrial services should be extended to provide marketing support to small producers on a collective basis.

E. International action

(20) International development assistance agencies, such as the specialized agencies of the United Nations system, bilateral donor

agencies and international non-governmental organizations should orient their priorities to the development of the low-cost building materials sector in developing countries. This should result in both increased technical assistance and financial assistance to the sector.

(21) Regional networks and regional centres should be promoted to facilitate the exchange of information relating to low-cost building materials and technologies between developing countries.

(22) Technology transfer should be promoted at the enterprise-to-enterprise level in the small-scale sector of the building materials industry.

(23) The activities of international non-governmental organizations for technology transfer and diffusion to the small-scale building materials sector should be promoted.

(24) The development of regional standards for low-cost building materials should be supported.

I. ORGANIZATION OF THE CONSULTATION

Opening of the Consultation

Statement on behalf of the Executive Director of Habitat

35. In his opening statement, the representative of the Executive Director of Habitat expressed his appreciation to the Government of Greece for having organized the Consultation and to UNIDO, the co-organizer of the Consultation. He stressed that the Consultation was taking place at a critical time. Following the adoption of the Global Strategy for Shelter to the Year 2000 5/ by the General Assembly in its resolution 43/181 of 20 December 1988, Governments in Member States were engaged in formulating and implementing strategies to tackle the shelter needs of the population in the developing countries. The small-scale sector was the unique instrument through which that Strategy could be implemented. Success at the national level depended to a great extent on the availability of basic building materials at affordable prices to the end-users. The building materials industry had failed to bridge the increasing gap between demand and production, as a result of which the dependence on imports had increased in many countries. Large-scale imports of technology packages, however, had not solved the difficulties.

36. Imports had bypassed the small-scale enterprises and had accentuated the parallelism in most countries of the development of the traditional small-scale sector on the one hand and of the organized or formal sector on the other. He added that structural linkages within the building materials industry should be strengthened and efforts made so that the appropriate technologies available in the international market could reach the small-scale industrial sector.

37. He drew attention to the energy-intensive, high-temperature process industries and to the depletion of natural resources, which were key problem areas that would have to be tackled if there was to be a balanced development of the building materials industry, including the prevention of environmental degradation. Much would have to be done to reverse current trends. In addition, the enormous task of rehabilitating and rebuilding the social and economic infrastructure in the former centrally planned economy countries would have challenging repercussions on the building materials industry in those countries. The Consultation, he concluded, should provide through its recommendations a broad strategy and practical means for concerted action on the part of national Governments and the international community for the sustainable development of the industry in the future.

Statement on behalf of the Director-General of UNIDO

38. The Director of the System of Consultations, on behalf of the Director-General of UNIDO, expressed his deep appreciation to the host country for the lengths to which it had gone in preparing for the Consultation. Concerning the basic problems faced by the developing countries, he said that the majority of those countries had not been able to meet their almost immeasurable need for

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5/ Official Records of the General Assembly, Forty-third Session, Supplement No. 8, addendum (A/43/8/Add.1).

housing, as well as basic infrastructural works. Shortfalls in the domestic supply of materials would not lessen as the demand increased at the same pace as population and economic growth in the years ahead. The majority of the developing countries depended on imports of basic materials such as cement, wood, iron and steel, and glass. External constraints on industrial development in the developing countries varied from worsening terms of trade, indebtedness and tariff barriers to high energy costs. The pace of technological change in the developed countries had also to be taken into account. He added that the flow of development funds might undergo significant structural changes owing to the attraction to investors of new markets in the emerging economies of Eastern and Central Europe.

39. Those external factors and major internal constraints had also hampered the building materials industry. Local resources were not being exploited properly on account of restricted markets and a lack of entrepreneurial skills and of strategies. Thus, there was scope for UNIDO to focus on the integration of the industry with other economic sectors. The Consultation should, therefore, emphasize the need for appropriate strategies and policies for the development of the industry, and consider how favourable conditions might be created to reduce the gap between demand and supply and how a greater reliance on local materials and resources might be promoted. Achievements were conceivable, with the support of Governments and the private sector in conjunction with international cooperation, as an essential part of future development plans for the building materials industry in the developing countries.

40. He stressed that the Consultation was one of the instruments for determining the appropriate policy approach and creating a climate favourable to improving the industry. It could also identify the means of securing long-term benefits for developing countries in mastering new technologies and promoting their national industry within the broader context of achieving their industrialization objectives.

Statement by the Under-Secretary for National Economy, Greece

41. On behalf of the Government of Greece, the Under-Secretary for National Economy welcomed the initiative taken by UNIDO in organizing the Second Consultation on the Building Materials Industry with a view to assisting the developing countries in their development efforts. He stressed the importance of the building materials industry and its qualitative and quantitative dimensions in terms of economic importance. He said that the production of building materials had assumed a strategic role in national economic development.

42. The Consultation was taking place at a critical international economic and financial juncture, as a consequence of which the developing countries were faced with shortages in their foreign currency earnings, coupled with high costs of borrowing and heavy indebtedness. Owing to that situation, the building materials industry was perhaps one of the key industrial activities that contributed to a reduced dependence on imports or even to increased exports.

43. He said that technological choices appropriate to the conditions of a country should be based on local capabilities and the availability of resources. In the current decade, developing countries had to examine the key role that the building materials industry could occupy in their economic

development strategies, as well as the limitations and prospects for the industry. He said that the efforts already made in the area of research, standardization and quality control should be intensified.

44. Both quality and innovation were two basic elements in industrial development. Enterprises should not only limit their activities to improving the quality and competitiveness of their products, but also extend their services to staff training and the development of an ecological balance. Strategic innovation and all-round quality should remain at the core of industrial progress.

45. He said that the building materials industry in Greece, from its initial stages until then, constituted a substantial part of the economic activities of the country. Cement and wood products, for instance, were both major export articles. He concluded by saying that international cooperation should help the developing countries to overcome the constraints they were facing in their efforts to promote their building materials industries.

Statement by the Director of the System of Consultations Division

46. In his introductory remarks, the Director of the System of Consultations Division thanked the Government of Greece for the excellent organizational arrangements that had been made for the Consultation. He said that the First Consultation on the Building Materials Industry held in 1985, also at Athens, had emphasized the cement industry in addition to the need to promote the informal sector of production. Based on its preparatory work for the Second Consultation, UNIDO considered that the building materials industry should be analysed as a whole, which would provide a broader approach to assisting the developing countries in the development of their national industry.

47. The first issue paper, therefore, focused on the building materials industry in its entirety and gave an overview of its main constraints and characteristics. The second issue paper emphasized mainly the complementary role of the low-cost building materials sector, including the conditions hampering its development.

48. With a view to optimizing promotional efforts and assistance to developing countries, UNIDO considered that the creation of a competitive and dynamic construction industry would increase the capabilities of those countries faced with a pressing demand for mass housing and infrastructural works. Consequently, the Industrial Development Board had agreed to the inclusion of the First Consultation on the Construction Industry in the Developing Countries in the programme of consultations for the biennium 1992-1993. 6/

Presentation of UNIDO activities

Industrial operations

49. A representative of the Department of Industrial Operations presented the activities of UNIDO in the building materials industry, the basic objective of

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6/ Report of the Industrial Development Board on the work of its sixth session, 28 May-1 June 1990 (GC.4/2), annex I, IDB.6/Dec.5.

which was to satisfy the needs of the developing countries for building and other infrastructural work for their economic development. The strategy for fulfilling that objective focused mainly on ensuring the availability of building materials, in terms of quality and quantity and the acceptable cost of locally produced materials, within the framework of public policies, support mechanisms and regulations.

50. Such a pragmatic programme approach was based on an integrated form of development, creating close linkages with other industrial sectors. Close cooperation was developed and maintained with owners of technology and research and development institutions with a view to maximizing in particular the effectiveness of technical assistance projects. Cooperation between donor countries, industries and recipient countries was also a cornerstone of UNIDO activities in order to ensure full benefits for the participating partners, including the recipient. Interagency cooperation between organizations of the United Nations system, namely, between Habitat, the United Nations Development Programme, the International Labour Organisation and the United Nations Educational, Scientific and Cultural Organization, was also highly desirable particularly in view of the fact that the recipient country could benefit from common project management, thus avoiding the overlapping of services and expertise.

51. The areas of technical assistance mainly focused on were the survey and inventory of raw materials, sectoral development planning, the development, transfer and adaptation of technology, the rehabilitation of existing plants and the establishment of new ones, energy management, the promotion of construction technologies and construction systems, and environmental control. The implementation process might involve more than two of those areas at a time. Different types of technical assistance and cooperation mechanisms were briefly described; namely, the promotion of low-cost building materials in Africa; a pragmatic approach to project implementation in China; and the establishment of a regional network in Asia and the Pacific.

52. In Cameroon, Chad and Zaire, a cluster of projects were being implemented focusing on the introduction and promotion of simple technologies for the small-scale production of stabilized soil blocks and fibro-cement roofing tiles for low-cost housing. A main objective was to introduce the most appropriate technologies at the lowest cost to the end-users. The establishment of local enterprises was encouraged and assisted through investment promotion activities and training, including training opportunities for construction workers.

53. Many building materials projects had been implemented during the past 10 years in China, most of which were linked to selected research and development institutes or design centres. UNIDO had played an important coordinating role. The projects covered subsectors such as heavy clay products, ceramic tiles, insulating materials, building glass, innovative technologies for the utilization of fly ash and fire prevention in high-rise buildings. Energy management, a priority objective nationally, had been an important element in the inter-project cooperation efforts between all the parties involved. As a result, China had been able to embark upon sharing its experiences and know-how with other developing countries in fly-ash utilization and energy management in the glass industry.

54. Other assistance consisted of the establishment in Manila, in 1983, of the Regional Network, with the main objective of facilitating the construction of

low-cost housing units for urban and rural areas with locally available resources. In 1990, the Network comprised 13 active member countries, each representing a national focal point headed by a national coordinator. The Network served as a vehicle for technical cooperation to the participating countries, in addition to providing assistance to those countries.

Investment promotion

55. The Director of the Industrial Investment Division, Department for Industrial Promotion, Consultations and Technology, said that the basic objective of the investment programme was to assist the entrepreneurial sector in developing countries to mobilize the foreign resources necessary to implement their development projects and to modernize or rehabilitate their industrial equipment.

56. He mentioned some concrete examples of industrial investment promotion in the field of building materials in Africa. In the wood industry, African entrepreneurs in Cameroon, the Congo, Ghana, Madagascar and Zaire and partners in the developed countries had been successfully identified. In the sector of stabilized bricks, two enterprises had been identified in Cameroon for cooperation and promotion.

Presentation of Habitat activities

57. A representative of Habitat highlighted three critical areas on which its activities were focused: (a) the creation of a suitable policy environment for the growth of the low-cost building materials sector; (b) the transfer and diffusion of appropriate technologies to improve the productivity of the low-cost building materials sector; and (c) the formulation of standards and specifications for locally produced building materials with a view to promoting their increased use in the construction of shelter and infrastructure. Habitat had been trying to apprise national policy makers of the critical issues facing the sector, in addition to concentrating its efforts on improving the productivity of the building materials industry, particularly the traditional sector, through the transfer and diffusion of technology. In addition, Habitat provided technical assistance through demonstration projects related to the transfer of technology.

58. He mentioned the formation of an information network in 11 African countries for which a journal provided a variety of information on new and innovative technologies, and standards and specifications for new materials. Efforts were also being made to develop a model mechanism for the transfer of technology to developing countries, which would facilitate close cooperation at the national level between the ministry responsible for housing and construction, research and training institutions and entrepreneurs. The mechanism would be introduced to developing countries in Africa, Asia and Latin America. Efforts were also being made to promote low-cost materials on a regional basis in Central America in the area of small-scale lime processing and marketing.

59. Habitat was also providing technical assistance, through its Technical Cooperation Division, in brick-making technology and bamboo construction techniques for low-income earthquake-resistant housing. A workshop had been organized in 1987, in cooperation with the African Regional Organization for Standardization and the Commonwealth Science Council, to identify constraints on the promotion of local standards for local building materials. Follow-up

discussions had been held in Ghana, Kenya and Malawi. Those meetings had recognized that the use of low-cost locally available materials was a viable alternative for reducing the costs of housing and infrastructure, particularly in low-income settlements, and therefore appropriate standards and specifications were essential for their wide-scale adoption.

60. He said that, in 1992-1997, emphasis would shift to increasing technical assistance to demonstration projects, based on experience gained during the previous medium-term plan, as well as to involving the private sector in both the production cycle and the end-use of building materials. Habitat was also engaged in promoting construction policies and programmes for the sustainable development of human settlements. Furthermore, it was actively involved in research projects for the formulation of guidelines for the environmental assessment of building materials, including the transfer of energy-efficient technologies.

Election of officers

61. The following officers were elected:

Chairman:	Theodossius Tassios (Greece), Professor, National Technical University of Athens
Rapporteur:	Trijugi N. Gupta (India), Executive Director, Building Materials and Technology Promotion Council, Ministry of Urban Development
Vice-Chairmen:	Ivo Solá Vila (Cuba), Director de Desarrollo de Materiales de Construcción, Ministerio de la Industria de Materiales de Construcción
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Adoption of the agenda

62. The Consultation adopted the following agenda:

1. Opening of the Consultation
2. Election of Chairman, Vice-Chairmen and Rapporteur
3. Adoption of the agenda and organization of work
4. Presentation of the issues by the UNIDO Secretariat and Habitat
5. Discussion of the issues:

   Issue 1: Strategies and policies for the development of the building materials industry in developing countries

   Issue 2: Measures to strengthen the low-cost building materials industry in developing countries

6. Conclusions and recommendations

7. Adoption of the report of the meeting

Adoption of the conclusions and recommendations

63. The conclusions and recommendations of the Second Consultation on the Building Materials Industry were adopted by consensus at the final plenary session on 8 November 1991. In addition, the elements of an operational strategy for the development of the low-cost building materials sector were also approved by consensus.

Documentation

64. The documents issued prior to the Consultation are listed in annex II.

II. REPORT OF THE PLENARY SESSIONS

Presentation of the issues

Issue 1: Strategies and policies for the development of the building materials industry in developing countries

65. A representative of UNIDO presented the first issue to be discussed by the Consultation. He stressed that timely steps should be taken to increase the productivity of the industry in order to meet the growing demand for housing and civil works.

66. He also noted the necessity for a coherent housing and construction policy, based on a realistic assessment of the local needs of the country and the use of local resources to counterbalance the increasing reliance on imports of basic building materials. The main problems hampering the industrialization efforts of the developing countries were high production costs on account of energy-intensive production methods, underutilization of installed capacity and utilization of technology inappropriate to local market conditions. The financial constraints faced by the majority of those countries affected also the restructuring of many production units; small markets and local economic realities also affected the development of the industry.

67. For secondary building materials, namely, brick and concrete-based products, market size was less critical as those materials were produced mainly by small- and medium-scale enterprises. However, major problems relating to those enterprises were common in developing countries. Poor quality products, low level of acceptance by end-users, lack of managerial skills and limited markets were among the major constraints commonly faced by the small- and medium-scale producers. An improvement of the industry as a whole was possible within a general framework of promotional policies. He said that both the private and public sectors should coordinate their efforts and play a key role in ensuring a better performance on the part of the building materials industry.

68. Taking into account the major constraints faced by the developing countries, the Consultation should discuss and recommend measures to support the development of the building materials industry. Those measures should relate to strategies to reduce production costs, to strengthen research institutions and the use of local resources, and to introduce changes in existing policies, including action-oriented strategies and policies, with a view to providing a more dynamic response from such a key industry. In the case of the former centrally planned economy countries, more opportunities for cooperation at the regional and interregional level might be brought about, given the far-reaching implications of the policies necessary for the creation of market-oriented systems.

Summary of discussion

69. A participant pointed out that many developing countries lacked housing policies. International organizations were requested to assist Governments in the formulation of such policies, the implementation of which would require appropriate instruments; for example, for the allocation of land and for financing. There should also be a dynamic tertiary sector for services such as the provision of electricity, plumbing and civil works. Another participant gave

examples of successful policy elements in a developing country in Asia, where the following had been established: (a) a dynamic system to finance housing; (b) an institutional mechanism for coordinating national housing policy with that of national economic boards, the private sector and financial institutions; (c) the establishment of flexible regulatory standards; and (d) competitive building materials and construction industries.

70. In formulating housing policies, another participant stressed that, in addition to technical considerations, policy makers should also consider the social dimension of the acceptability of housing projects by prospective homeowners. Acceptability was more likely if the population concerned were able to participate in the implementation of such projects. Other elements were of equal importance; for example, income group and level. He suggested that the authorities in developing countries should show the political willingness to create integrated housing construction programmes in concerted action with the local population concerned. The process of involving local inhabitants in their own housing projects could bring the essential element of a motivated population into general efforts for development.

71. A participant drew attention to the shortage of building materials in many developing countries owing to the increased demand for housing. He cautioned that unless innovative steps were taken, the gap between the demand for, and the supply of, building materials would continue to widen. He said that both the building materials and the construction industries should be closely linked in order to optimize the approach of developing countries to the housing problem.

72. Several participants advocated the integration of the building materials industry within a broad context that would encompass overall construction needs, including public and private programmes of housing and infrastructure works. That approach would allow a coordinated response to be made to the demand for building materials at the national level. Furthermore, initiatives and responsibilities should also be given to decision makers, who should operate jointly at the local level of execution in both the public and the private sectors.

73. Another participant pointed out that there was a lack of statistical data on building materials in general. Such data would help in analysing and forecasting needs and in assessing the capabilities and the capacity of a country to provide adequate supplies. Surveys should be made with the assistance of international organizations; for example, UNIDO and Habitat.

74. A participant suggested that the data should be expanded to include socio-economic elements such as family structure and income profile. He stressed that attention should be given to effective demand based mainly on the purchasing power of the population.

75. Another participant expressed the view that the underutilization of installed production capacy was a major problem in most developing countries and was due primarily to the market capacity having been overestimated at the feasibility study stage. He said that production capacity should be viable and within the limits of the financial resources available. In addition, production technology should be properly adapted to local conditions. Moreover, if building materials produced in developing countries were intended for the international market, they should be subject to quality approval in order to be competitive. He added that, considering the variety of expertise necessary

to develop the industry, such as technology, management, energy and financing, collective action was fundamental at both the national and international level.

76. One participant indicated that the industrialization efforts in many developing countries had not produced the expected results. He added that many productive units, particularly in his country, were working at about 15-20 per cent of their capacity and the privatization programme undertaken by the Government had not met expectations. He stressed that in-depth techno-economic studies should be the basic instruments for setting up industrial projects and that the establishment of production units that were too large for the local market should be avoided. Given the restricted market conditions in many developing countries, efforts should be made to encompass a regional or subregional dimension that could ensure proper viability for the market.

77. Several participants concurred that the production of building materials was not a goal per se. The primary objective of providing an adequate supply of materials was their production at an affordable cost. Many participants expressed concern regarding high production costs derived from, inter alia, imports of fuel (the main source of energy in many countries). Ageing machinery and equipment was an additional financial burden. Research and development institutions and professional technical centres should assist the building materials industry in finding alternative methods of reducing production costs.

78. A participant from a developing country outlined a successful case of the rehabilitation of a brick factory. The main objectives had been to save energy at the production level, and to reduce production costs and reliance on imports from neighbouring countries. An appropriate transfer of technology had been made possible with international cooperation; in addition, technical assistance had been provided through bilateral aid and the participation of UNIDO. New machinery had been installed and a new process for the fabrication of hollow bricks developed, based on stabilized clay mixed with cement. He said that the new approach, allowing for the elimination of the oven and the drier, had resulted in significant savings in energy. The mechanical characteristics of the bricks were almost similar to those of conventionally baked ones and, in addition, complied with international standards.

79. The issue of energy savings was raised, in another context, by a representative of a developed country in Eastern Europe. He said that the building materials industry there could not provide the market with satisfactory insulating materials for exterior walls. As a result, there was an excessive consumption of costly imported heating fuel. Appropriate manufacturing technology, in addition to approved standards for the application of thermal insulating materials, would contribute to significant savings in energy. He noted that, in that particular context, the building materials industry could be assisted through joint ventures with foreign capital. Such an approach would, however, need appropriate investment policies, including such incentives as tax concessions, and international cooperation.

80. The question of financing was also discussed. Given the important role that the building materials industry was playing in developing country economies, all the participants agreed that specialized banking and financing institutions should be more flexible when approached by entrepreneurs. One

participant noted that, generally, current regulations did not facilitate investment in the industry, particularly in the small-scale sector. Another participant mentioned that in view of the structural adjustments being undertaken in many former centrally planned economy countries, financing was a paramount issue also to them. In addition, international cooperation was needed in the efforts of those countries to restructure their building materials and construction industries so as to adjust to a market-oriented system.

81. Environmental matters regarding cleaner production technologies and environmental control were also raised during the discussion by participants from developed and developing countries alike. All concurred that the exploitation of natural resources and the production of building materials should be carried out under regulatory conditions aimed at protecting the environment and avoiding irreversible damage.

Issue 2: Measures to strengthen the low-cost building materials industry in developing countries

82. A representative of Habitat presented the second issue to be discussed by the Consultation. He stressed that the term "low-cost building materials" was used to refer collectively to materials that were produced for consumption in local markets and that were made by using locally available raw materials and skills. Such materials had the following characteristics in common: production on a small scale by the informal sector, using simple techniques and technologies, and reliance on their price advantages over building materials produced by the organized sector.

83. Low-cost building materials in developing countries were important for two reasons. The first was that Governments were increasingly shifting the burden of shelter programmes onto individual house builders, and construction activities were increasingly becoming the responsibility of small-scale and micro-enterprises. As a result of the Global Strategy for Shelter to the Year 2000, overriding importance was being given to strengthening the capacity of small producers. The second was the significant share in output of the small-scale sector in many developing countries. For instance, in one country in Asia, the production of bricks, tiles, sand and lime constituted over 35 per cent of the total value of the building materials produced in the country. In another country in Asia, about 80 per cent of the building materials were produced mainly by small-scale plants.

84. Despite its importance, the low-cost building materials sector received a low level of attention and support from policy makers, credit institutions and the international community. In addition, it was not integrated into government programmes and projects. In many developing countries, Governments played an entrepreneurial role through State enterprises resulting, in most cases, in centralized production often with bilateral aid programmes; there had been little interaction between small-scale producers and Governments. The large informal sector continued to operate at subsistence level, unable to improve the quality of its output and had little access to support services as was the case for the institutionalized production networks.

85. He stressed also that one of the major obstacles preventing the small-scale sector from improving its productivity and performance was its excessive reliance on traditional techniques. Efforts should be made to facilitate its transition from a subsistence operation to a productive one. Owing to the

constraints on the sector, national research and development institutions and organizations of professionals should be more responsive to the problems affecting small producers. The adaptation of imported technologies to local conditions, training programmes, pricing policies and extension services were, inter alia, areas that especially deserved attention. Regulations discriminating against the use of locally made building materials should equally be subject to scrutiny.

86. In concluding, the representative of Habitat emphasized other key areas that also needed particular attention, such as the creation of a policy environment and the strengthening of measures through institutional support mechanisms in order to increase growth, improve quality and utilize capacity to the full. He also highlighted the complementarity of international cooperation between developing countries, which should be encouraged, as well as North-South cooperation.

Summary of discussion

87. The participants emphasized the need for a global approach to deal with the constraints on the small-scale sector of the building materials industry. As in the case of the formal sector, innovative and alternative approaches would be required to find appropriate solutions to the problems inhibiting the growth of the low-cost building materials industry. A participant suggested that in order to improve the quality of output, a combination of both industrial and artisanal approaches would be necessary. As modular construction techniques lent themselves to the use of local materials, he noted that they could be a viable choice for the developing countries.

88. As regards technology transfer, it was noted that attempts should be made at three levels: (a) regional and South-South; (b) North-South, and (c) at that of the laboratory to the industry. In the case of the South-South transfer of technology, it was important to identify technology that was appropriate. Regarding North-South transfer, the recipient country should have sufficient capacity for the effective diffusion of technology to the industry. One participant pointed out that non-governmental organizations could play an important role in technology transfer. Nevertheless, the strengthening of traditional technologies should be given priority.

89. It was emphasized that in order for technology to be effectively transferred and diffused to the domestic industry, it would be essential to establish a national coordination body. That body could provide the necessary guidelines and promote the commercialization of pilot-plant studies and research results in addition to providing the pre-investment certification of new technologies. It could also provide training through building centres. Mention was made of the UNIDO programme on building materials production and use in Madagascar, which included the diffusion of acquired technologies.

90. One participant stressed the need for assistance and coordination at the national level for the production of low-cost building materials using local resources. He suggested that building centres could offer such assistance and coordination and would be particularly useful for public housing projects. In a developing country in Asia, for instance, a product promotion council assisted small-scale entrepreneurs in obtaining access to markets in the formal sector. Industrial estate cooperatives were also a useful means of assistance, particularly in improving the capacity of micro-enterprises.

Special industrial estates were provided by the State to promote the utilization of particular products such as fly ash or phosphor-gypsum.

91. Another participant pointed out that regional studies should be carried out on new deposits of raw materials, which should include the quality and proven value of the deposits. The results should help in creating a regional data bank that could be useful for the building materials industry. Several participants highlighted the need for increased institutional support for the standardization of building materials and products. It was suggested that standardization should be performance-oriented.

92. A participant stressed that new and innovative building materials should receive technical certification so as to facilitate their wide-scale use in construction, and specialized laboratories should be set up to carry out that task. Reference networks of national laboratories should also be established. Such activities could be supervised by a national advisory committee for the construction sector. The importance of preparing standards, specifications and manuals for the popularization of new and innovative building materials was repeatedly underlined during the discussion.

93. A participant pointed out that one of the major constraints on the growth of the low-cost building materials sector was the limited capacity of the market to pay for building materials. It was therefore imperative that production costs be reduced in order to stimulate demand. Nevertheless the quality of the products should be upgraded in order to gain acceptance for market penetration into the formal sector of construction. The question remained of how quality could be achieved without increasing costs.

94. Mention was made of the importance of financial support to the industry. A participant suggested that banks and other development financial institutions should assist developing countries, through special agreements, in the acquisition of new and innovative technologies. Attention was drawn to the case of financing institutions in a developing country in Asia, which were supporting small-scale entrepreneurs in the technological upgrading of their enterprises. In other cases, three separate funds had been established; namely, for small business, technology promotion and new project development. Regarding measures to strengthen institutions, it was stressed that the availability of venture capital for innovations and the development of new technology was crucial to the improvement of the productivity of the industry.

95. Discussions focused on the relevance of fiscal, technology and industrial development policies. Key areas of intervention could include, inter alia, incentives for energy-efficient technologies and for environment-friendly technologies; and exemption from excise duty for special equipment.

96. The importance of regional networks for the dissemination of information was mentioned in connection with human resource development, research, technological information, and international cooperation and support in those areas. It was noted that UNIDO and Habitat had been instrumental in organizing such networks in Africa and Asia. Regarding human resource development, it was suggested that training workshops should be organized for small entrepreneurs and artisans. In assessing skill development programmes, it was suggested that the need for the integration of women into industrial development should be given consideration.

Annex I

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Annex II

LIST OF DOCUMENTS

Issue papers

Issue 1:	Strategies and policies for the development of the building materials industry in developing countries	ID/WG.510/1
Issue 2:	Measures to strengthen the low-cost building materials industry in developing countries	ID/WG.510/2

Background documents

New developments in the building materials industry	ID/WG.510/3
From central planning to market systems: Implications of economic reforms for the construction and building industries	ID/WG.510/4

Information documents

Building materials in Central America	ID/WG.479/1(SPEC.)
Timber as building material in Central America	ID/WG.479/3(SPEC.)
Report: Regional Expert Group Meeting on Co-operation and Development in the Field of Building Materials Production, Guatemala City, Guatemala, 24-27 October 1988	ID/WG.479/4(SPEC.)
Co-operation between developing countries in technologies and standards for local building materials	ID/WG.496/1(SPEC.)
An overview of the building materials industry in Africa and Asia	ID/WG.496/2(SPEC.)
Report: Interregional Expert Group Meeting on the Building Materials Industry for Africa and Asia, Nairobi, Kenya, 20-23 November 1989	ID/WG.496/4(SPEC.)

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